epiTRENDS

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In This Issue:

Health Care Agencies and Providers Are Promoting A Systems Approach to Reduce Medication Errors

Medication errors can cause injury and death. Total national costs (lost income, lost household production, disability, and health care costs) of all types of preventable medical errors range between $17 billion and $29 billion, according to estimates of the Institute of Medicine (IOM).

The 2000 Washington State Legislature mandated the Department of Health to develop a comprehensive strategy on medication errors involving government, industry, consumers, and health care providers. As part of its effort, the department reviewed the IOM analysis of the causes of medical errors.

IOM concluded that health care delivery systems are complex and prone to accidents. Most errors occur when more than one factor within a system breaks down. IOM proposes a comprehensive strategy to improve the safety and reliability of care delivery systems in the United States and has issued a national call to health care organizations and providers to take action to prevent medical errors (IOM 2000).

Numerous meetings, site visits, and discussions with staff from hospitals across the state revealed limitations in the ability of the state regulatory framework to identify the extent and frequency of medication errors and identified several fundamental roadblocks to public efforts to reduce the incidence of errors. They include a culture that demands perfection and a belief that people, not systems, produce error. Discussions clarified the importance of creating a nonpunitive environment that values the

Continued page 2

Indoor Mold Exposure Can Pose Health Threats

Recent reports in the medical literature and the popular press raise concerns about potential health effects from exposure to mold and mold products in indoor environments. Molds grow indoors if water leaks or lack of ventilation produce moist or wet conditions. Issues of interest to health professionals are the mechanisms and effects of exposure and measures to prevent or ameliorate effects.

Health effects generally fall into four categories of allergy, infection, toxicity, and irritation (mucous membrane and sensory). The various mold species, their metabolic products, the amount and duration of exposure, and a person's susceptibility all influence response. Susceptibility varies by age, gender, genetic predisposition, and concomitant exposure to other air contaminants.

Exposures and Health Effects

Allergy — The most common response to mold exposure may be allergy, with reactions that can range from mild and transitory to severe and chronic. Atopic individuals may develop symptoms when their respiratory system or skin is exposed to mold or mold products to which they have become sensitized. The Institute of Medicine (1993) has reported that allergic rhinitis is the single most common chronic disease. Additionally, about 14% of Americans suffer from allergy-related sinusitis, and 10–12% have allergy-related asthma. However, a recent study by the Mayo Clinic (1999) suggested that

Continued page 4

Medical Errors *(from page 1)*

individuals in the system while recognizing and learning from errors and near misses. DOH has proposed recommendations for reducing medication errors (Table 1).

Initial efforts will focus on courses of action with broad common agreement and that provide the greatest return on collective effort expended. The Department of Health will eventually expand its efforts into the broader realm of medical error by continuing a dialogue with the public, other agencies, and industry on how to minimize errors stemming from any aspect of health care.

For More Information

Visit the DOH web site at: http://www.doh.wa.gov/MedErrors/mederr1.htm or send an email message to: mederrors@doh.wa.gov

Reference:

Institute of Medicine. *To Err Is Human: Building a Safer Medical System*, LT Kohn, JM Corrigan, M Donaldson (eds). Washington, DC: National Academy Press, 2000.

Table 1: Recommendations on methods for reducing medication errors

Increase prescription legibility.

1. Eliminate all handwritten prescriptions by 2005. *Legislation is required.*
2. Encourage the use of standard prescription preparation practices in the education and continuing education of prescribers.
3. Encourage the use of electronic entry, hand-held computer, or other similar technology to increase prescription legibility.
4. Establish and encourage the use of standard terminology elements, e.g., units, abbreviations.
5. Support federal efforts to increase prescription legibility.

Minimize confusion in prescription drug labeling and packaging.

1. Require prescribers to include a notation of purpose (not necessarily diagnosis) on all prescriptions. *Legislation is required.*
2. Require prescribers to record the precise age of children under 14 years old. *Legislation is required.*
3. Encourage the use of a notation of purpose on the prescription label.
4. Support federal efforts to reduce look-alike labeling and packaging.
5. Urge Congress to take action to reduce confusion in drug labeling and packaging.

Develop medication error reporting plans.

1. Coordinate the development of a common language for all health care providers to facilitate meaningful exchange of information.
2. Sites with established quality improvement programs should have a mandatory component to evaluate and reduce the incidence of medication errors (DOH does not believe a centralized statewide reporting system is needed at this time).
3. Sites with established quality improvement programs should have a mandatory component to evaluate and reduce the incidence of medication errors.
4. Encourage greater institutional use of the Health Care Services Quality Improvement Program (CQIP). Modify state legislation to expand access to its provisions and allow institutions to share information.
5. Support reasonable federal efforts; a national system should be developed to collect and assess errors and near misses.

Encourage hospitals and health care organizations to implement proven medication safety practices, including the use of automated drug-ordering systems.

1. The state should convene a work group of representatives from all health care industry to review and identify "best practices," set state focus, and develop a mechanism for sharing best practices.
2. The state should assume a leadership role in the education of health care providers through a variety of mechanisms such as web site development, continuing education, and publication of useful information.
3. Encourage institutions to use multidisciplinary analysis teams to reduce medication errors. Prescribers, nurses and pharmacists should all participate in the process.

Reduce confusion created by similar-sounding drug names.

1. Support and encourage federal efforts to minimize confusion caused by similar-sounding drug names.
2. Encourage prescribers to eliminate the use of abbreviations of drug names on all prescriptions and drug orders.

Increase patient education on medications they are prescribed.

1. Funding should be allocated for patient education efforts by states, the federal government, and/or private organizations.
2. Encourage the expansion of private efforts, e.g., the Washington State Pharmacists Association Smart Rx program, or Spokane's NSAIDS project, to educate patients. Increased focus on the potential for interaction between prescribed medications and patient use of over-the-counter drugs and herbal supplements

Monthly Surveillance Data by County

December 2000* – Washington State Department of Health

County	E. coli O157:H7	Salmonella	Shigella	Hepatitis A	Hepatitis B	Non-A, Non-B Hepatitis	Meningococcal Disease	Pertussis	Tuberculosis	Chlamydia	Gonorrhea	AIDS	Pesticides†	Lead§#
Adams	0	0	0	0	0	0	0	0	0	2	0	0	0	3/92
Asotin	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Benton	0	0	2	0	0	0	0	1	0	33	2	1	0	0/7
Chelan	0	0	1	0	0	0	0	0	0	10	3	1	0	0/6
Clallam	0	0	0	0	0	0	0	0	0	8	0	0	0	0/0
Clark	0	0	1	0	0	0	0	0	0	42	6	7	0	0/15
Columbia	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Cowlitz	0	1	0	1	1	0	0	0	0	8	0	0	0	0/30
Douglas	0	0	0	0	0	0	0	0	0	3	0	0	0	0/0
Ferry	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Franklin	0	0	0	0	0	0	0	0	0	23	0	0	0	0/13
Garfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Grant	0	0	0	0	0	0	1	0	0	13	0	0	0	0/49
Grays Harbor	1	0	0	2	0	0	0	0	0	8	0	0	0	0/0
Island	0	0	0	0	0	0	0	0	0	9	1	0	0	0/5
Jefferson	0	0	0	0	0	0	0	0	0	1	0	0	0	1/#
King	2	11	7	5	1	0	4	12	12	406	165	43	1	0/43
Kitsap	0	1	0	0	0	0	1	3	0	37	3	2	0	0/6
Kittitas	0	1	0	0	0	0	0	0	0	7	0	0	0	0/#
Klickitat	0	0	0	1	0	0	0	0	0	1	0	0	0	0/0
Lewis	0	0	1	0	0	0	0	0	0	5	0	0	0	0/#
Lincoln	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Mason	0	0	1	1	1	0	2	0	0	12	1	1	0	0/0
Okanogan	0	0	1	0	0	0	0	1	0	5	0	0	1	0/#
Pacific	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Pend Oreille	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Pierce	0	2	0	2	1	1	0	6	4	164	54	21	0	0/34
San Juan	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Skagit	0	3	0	0	0	0	0	2	0	26	0	1	0	0/6
Skamania	0	0	0	0	1	0	0	0	0	0	0	0	0	0/0
Snohomish	2	5	1	2	0	0	0	7	2	102	11	5	0	0/9
Spokane	0	0	0	0	0	0	0	0	3	65	9	4	0	0/19
Stevens	0	0	0	0	0	0	0	0	0	5	0	0	0	0/0
Thurston	0	1	0	0	0	2	0	0	0	28	1	1	1	0/6
Wahkiakum	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Walla Walla	1	0	0	0	0	0	0	0	0	8	0	1	0	2/25
Whatcom	0	0	0	0	1	0	0	0	1	28	3	0	0	2/#
Whitman	0	1	0	0	0	0	0	0	0	1	0	2	0	0/0
Yakima	1	4	7	1	0	0	2	0	1	70	12	1	2	0/10
Unknown														0/0
Current Month	7	30	22	15	6	3	10	32	23	1137	271	91	5	8/389
December 1999	38	174	66	190	45	5	30	109	32	1178	244	99	3	4/224
2000 to date	228	585	456	283	113	34	66	423	258	13066	2419	479	312	141/4402
1999 to date	186	792	172	505	111	24	93	739	258	11964	2131	374	273	111/3608

* Data are provisional based on reports received as of December 31, unless otherwise noted.

† Unconfirmed reports of illness associated with pesticide exposure.

§# Number of elevated tests (data include unconfirmed reports) / total tests performed (not number of children tested); number of tests per county indicates county of health care provider, not county of residence for children tested; # means fewer than 5 tests performed, number omitted for confidentiality reasons.

WWW Access Tips

The Washington State Department of Health's report — *Is Indoor Mold Contamination a Threat to Health?* — is available at: http://www.doh.wa.gov/ehp/oehas/mold.html

Information Sources

See WWW Access Tips.

American Conference of Governmental Industrial Hygienists. *Bioaerosols: Assessment and Control.* Cincinnati: ACGIH Publishing, 1999.

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Indoor Molds *(from page 1)*

fungal sinusitis might not be a purely allergic phenomenon. Researchers found numerous species of mold in the nasal mucous of patients studied, along with eosinophilia and inflammation, but not Type I hypersensitivity.

Infection — Infection from molds that grow in wet indoor environments is uncommon except in susceptible populations such as those with immune compromise from disease or drug treatment. *Aspergillus fumigatus* can grow indoors and is a known source of nosocomial infections among immune-compromised patients.

Toxicity — Many molds can produce secondary metabolites such as antibiotics and mycotoxins that seem to give these organisms a competitive advantage over others growing in the same ecological niche. Mycotoxins are almost all cytotoxic, disrupting various cellular structures such as membranes and interfering with vital cellular processes such as synthesis of proteins, RNA, and DNA, and energy metabolism. Some mycotoxins have acute, lethal effects at mg/kg concentrations or less.

Aflatoxin (produced by several *Aspergillus* species) is among the most potent known liver toxins and carcinogens. Trichothecenes, produced by such molds as *Stachybotrys chartarum*, *Memnoniella echinata*, *Trichoderma*, *Trichothecium*, and *Acremonium*, are among the most potent inhibitors of protein synthesis. Mycotoxins can directly affect route of entry (respiratory system, skin, digestive tract), or, if absorbed systemically, can affect the nervous system, the liver, the kidney, and other organs. Toxins may have specific target organs or exert a more generalized toxic effect.

People living or working in wet buildings contaminated with toxigenic molds can be exposed to mycotoxins via inhalation of spores, dust, or other mold parts, or via dermal contact with contaminated surfaces. Several studies have reported that occupants of mold-contaminated buildings have increased susceptibility to infectious disease. An association with bleeding from the respiratory tract in young infants living in damp and moldy homes has been reported, and continues to be investigated.

Exposure Assessment and Prevention

Assessment of exposure remains the most difficult aspect of determining mold-related illness. Growth of mold is a dynamic process that varies with available nutrients, level of moisture, age of cultures, and competition among microbes. Exposure in buildings is also variable, depending on location of the occupants, location of and life cycle (i.e., bloom) of molds, and disturbances that can cause them to become airborne.

The most effective way of preventing health effects from mold exposure is through proper design, siting, and construction of buildings to control moisture. Once contamination has occurred, remediation of the moisture sources and clean up of contamination is needed to prevent continuing health effects. Proper ventilation and dehumidification can also be used to aid in moisture control. For more information, consult the resources noted in left column.

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